UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,497	06/28/2001	Darren Schmidt	5150-52200	7448

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EXAMINER
WACHSMAN, HAL D

ART UNIT	PAPER NUMBER
2857	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/894,497	SCHMIDT ET AL.
	Examiner	Art Unit
	Hal D Wachsman	2857

-- Th MAILING DATE of this communication appears on th cover sheet with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-20,42-47,53,55-58 and 64-83* is/are pending in the application.

  4a) Of the above claim(s) *83* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-20,42-47,53,55-58 and 64-82* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a)☐ All b)☐ Some * c)☐ None of:

  1.☐ Certified copies of the priority documents have been received.

  2.☐ Certified copies of the priority documents have been received in Application No. _____.

  3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
  application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
  Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

1.   Claim 83, was withdrawn from consideration as being directed toward a non-

elected invention as indicated in paragraph one of the previous Office action as it was a

claim for a different invention (see MPEP 821.03) added after an Office action.

However, claim 83 has not been cancelled. Appropriate correction is required.

2.   As was indicated in paragraph 3 of the previous Office action, the declaration is

objected to because there is a cross-out of the citizenship for inventor Ram Rajagopal

which has not been initialed and dated. The Examiner acknowledges the Applicant's

response on page 19 of the reply that the Applicant is in the process of correcting the

declaration however to date the corrected (supplemental) declaration has not yet been

received. Consequently, appropriate correction is still required.

3.   The specification is objected to as failing to provide proper antecedent basis for

the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction

of the following is required: There is no reference in the specification to "**proper** subset".

Claim Rejections - 35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

5.   Claims 1, 4-19, 42-47, 53, 55-58 and 64-82 are rejected under 35 U.S.C. 101

because the claimed invention is directed to non-statutory subject matter.

The claims indicated above, recite a series of mathematical operations for curve

fitting in which the claims recite no clearly defined practical application or do not draw a

conclusion as to the final end result of the mathematical operation being directed toward

a practical application. In addition, the claims do not fall into either of the "safe harbors"

defined in the Guidelines for Computer-Implemented Inventions in that there is no

manipulation of measured data representing physical objects or activities to achieve a

practical application (pre-computer process activity – data gathering) or the

performance of independent physical acts (post-computer process activity). However,

the Examiner does note that <u>claim 20</u> which depends from claim 1 <u>does have a</u>

<u>limitation in which the final end result of the mathematical operations is directed toward</u>

<u>a practical application</u> (i.e. "wherein the plurality of data points comprises pixels of an

image; and wherein the **curve fitting method operates to perform edge detection on**

the image") and claim 20 is statutory under 35 U.S.C. 101. Therefore, one possible

solution, subject to further review, to overcome the 35 U.S.C. 101 rejection, would be to

incorporate the limitations of the practical application shown in claim 20 into the body of

the claim of each independent claim.

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7.   Claims 1, 4, 13, 15-17, 42, 43, 53, 72, 80 and 81 are rejected under 35

U.S.C. 102(b) as being anticipated by Roth (5,617,491).

As per claim 1, Roth (see at least abstract) discloses "receiving a plurality

of data points". Roth (Abstract, figures 2a, 2b, 3a, 3b) discloses "generating a curve

based on two or more random points of the plurality of data points". Roth (Abstract, col.

2 lines 48-54, col. 5 lines 45-48, 63-67, col. 6 lines 1, 2, 40-66, col. 8 lines 62-67, col. 9

lines 1-6) discloses "testing the curve against a first subset...wherein the first subset is

a proper subset of the plurality of data points,...testing produces first test results". Roth

(Abstract, figures 2a, 2b, 3a, 3b, col. 2 lines 48-57, col. 5 lines 45-48, 63-67, col. 6 lines

1, 2, 40-66, col. 9 lines 54-65) discloses "performing (b) and (c) a plurality of times to

determine a curve which meets first criteria...in an iterative manner until ending criteria

are met". Roth (Abstract, col. 9 lines 63-67) discloses "if said first test results meet said

first criteria, outputting information regarding the curve".

As per claim 4, the ending criteria has already been addressed above and

Roth (col. 2 lines 55-57, col. 9 lines 63-65) discloses "the number of iterations meeting

or exceeding an iteration threshold". Roth (col. 2 lines 44, 45, 52-54) discloses "a

number of data points of the plurality of data points within a specified radius of the curve

meeting or exceeding a specified minimum value".

As per claim 13, Roth (col. 2 lines 52-57) discloses "determining a number

of the subset ....within a specified radius of the curve; wherein said first test results

comprise said number of the first subset of the plurality of data points which are within

the specified radius of the curve".

As per claim 15, Roth (see at least abstract) discloses the feature of this claim.

As per claim 16, Roth (Abstract, figures 2a, 2b, 3a, 3b, 4d) discloses the feature of this claim.

As per claim 17, Roth (figure 4b) discloses the curve comprising a line.

As per claim 42, Roth (Abstract, figures 2a, 2b, 3a, 3b) discloses "generating a curve based on two or more random points of the plurality of data points". Roth (Abstract, col. 2 lines 48-54, col. 5 lines 45-48, 63-67, col. 6 lines 1, 2, 40-66, col. 8 lines 62-67, col. 9 lines 1-6) discloses "testing the curve against a first subset...wherein the first subset is a proper subset of the plurality of data points..testing produces first test results". Roth (Abstract, figures 2a, 2b, 3a, 3b, col. 2 lines 48-57, col. 5 lines 45-48, 63-67, col. 6 lines 1, 2, 40-66, col. 9 lines 54-65) discloses "performing (a) and (b) a plurality of times to determine a curve which meets first criteria... in an iterative manner until ending criteria are met". Roth (Abstract, col. 9 lines 63-67) discloses "if said first test results meet said first criteria, outputting information regarding the curve".

As per claim 43, the ending criteria has already been addressed above and Roth (col. 2 lines 55-57, col. 9 lines 63-65) discloses "the number of iterations meeting or exceeding an iteration threshold". Roth (col. 2 lines 44, 45, 52-54) discloses "a number of data points of the plurality of data points within a specified radius of the curve meeting or exceeding a specified minimum value".

As per claim 53, Roth (Abstract, figures 2a, 2b, 3a, 3b) discloses "generate a curve based on two or more random points of the plurality of data points".

Roth (Abstract, col. 2 lines 48-54, col. 5 lines 45-48, 63-67, col. 6 lines 1, 2, 40-66, col. 8 lines 62-67, col. 9 lines 1-6) discloses "test the curve against a first subset...to produce first test results, wherein the first subset is a proper subset of the plurality of data points". Roth (Abstract, figures 2a, 2b, 3a, 3b, col. 2 lines 48-57, col. 5 lines 45-48, 63-67, col. 6 lines 1, 2, 40-66, col. 9 lines 54-65) discloses "perform (a) and (b) a plurality of times to determine a curve which meets first criteria...in an iterative manner until ending criteria are met". Roth (col. 2 lines 55-57, col. 9 lines 63-65) discloses "the number of iterations meeting or exceeding an iteration threshold". Roth (col. 2 lines 44, 45, 52-54) discloses "a number of data points of the plurality of data points within a specified radius of the curve meeting or exceeding a specified minimum value". Roth (Abstract, col. 9 lines 63-67) discloses "if said first test results meet said first criteria, outputting information regarding the curve". Roth (Abstract, col. 9 lines 10-16) discloses a computer system which contains a CPU and a memory medium which can store program instructions. Roth (see at least abstract) discloses the input which is operable to receive a plurality of data points.

As per claim 72, Roth (see at least abstract) discloses "receiving a   ‹ plurality of data points". Roth (Abstract, figures 2a, 2b, 3a, 3b) discloses "generating a curve based on two or more random points of the plurality of data points". Roth (Abstract, col. 2 lines 48-54, col. 5 lines 45-48, 63-67, col. 6 lines 1, 2, 40-66, col. 8 lines 62-67, col. 9 lines 1-6) discloses "testing the curve against a first subset ...wherein the first subset is a proper subset of the plurality of data points..testing produces first test results, wherein said testing the curve ...comprises:". Roth (col. 2 lines 44, 45, 52-54)

discloses "determining a number of the first subset of the plurality of data points which
are within a specified radius of the curve..said first test results comprise said number of
the first subset of the plurality of data points which are within the specified radius of the
curve". Roth (col. 9 lines 60-67) discloses "if said first test results meet first criteria,
outputting information regarding the curve".

As per claim 80, Roth (Abstract, figures 2a, 2b, 3a, 3b) discloses
"generating a curve based on two or more random points of the plurality of data points".
Roth (Abstract, col. 2 lines 48-54, col. 5 lines 45-48, 63-67, col. 6 lines 1, 2, 40-66, col.
8 lines 62-67, col. 9 lines 1-6) discloses "testing the curve against a first subset
...wherein the first subset is a proper subset of the plurality of data points...testing
produces first test results". Roth (Abstract, figures 2a, 2b, 3a, 3b, col. 2 lines 48-57, col.
5 lines 45-48, 63-67, col. 6 lines 1, 2, 40-66, col. 9 lines 54-65) discloses "performing (a)
and (b) a plurality of times to determine a curve which meets first criteria...in an iterative
manner until ending criteria are met, and wherein said ending criteria ...one or more of".
Roth (col. 2 lines 55-57, col. 9 lines 63-65) discloses "the number of iterations meeting
or exceeding an iteration threshold". Roth (col. 2 lines 44, 45, 52-54) discloses "a
number of data points of the plurality of data points within a specified radius of the curve
meeting or exceeding a specified minimum value". Roth (Abstract, col. 9 lines 63-67)
discloses "if said first test results meet first criteria, outputting information regarding the
curve".

As per claim 81, Roth (see at least abstract) discloses "receiving a
plurality of data points". Roth (Abstract, figures 2a, 2b, 3a, 3b) discloses "generating a

curve based on two or more random points of the plurality of data points". Roth

(Abstract, col. 2 lines 48-54, col. 5 lines 45-48, 63-67, col. 6 lines 1, 2, 40-66) discloses

"testing the curve against a first subset ..wherein the first subset is a proper subset of

the plurality of data points...testing produces first test results". Roth (Abstract, figures

2a, 2b, 3a, 3b, col. 2 lines 48-57, col. 5 lines 45-48, 63-67, col. 6 lines 1, 2, 40-66, col. 9

lines 54-65) discloses "performing (b) and (c) a plurality of times to determine a curve

which meets first criteria...in an iterative manner until ending criteria are met, and

wherein said ending criteria ...one or more of". Roth (col. 2 lines 55-57, col. 9 lines 63-

65) discloses "the number of iterations meeting or exceeding an iteration threshold".

Roth (col. 2 lines 44, 45, 52-54) discloses "a number of data points of the plurality of

data points within a specified radius of the curve meeting or exceeding a specified

minimum value". Roth (Abstract, col. 9 lines 63-67) discloses "if said first test results

meet first criteria, outputting information regarding the curve".

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of

the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9.   Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roth (5,617,491) in view of Silver et al. (6,408,109).

        As per claim 20, Silver et al. (see at least abstract) disclose that the plurality of data points comprises pixels of an image. Silver et al. (col. 3 lines 56-67, col. 4 lines 1, 2) disclose that the curve fitting method operates to perform edge detection on the image. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Silver et al. to the invention of Roth as specified above because as taught by Roth (col. 1 lines 56-60) it was common for image processing systems relating to three dimensional images, to invoke methods that map pixels, in the form of range image data points to planar surfaces, or to second order or higher order surfaces, thereby approximating range image data points by surfaces.

10.   Applicant's arguments filed 3-24-04 have been fully considered but they are not persuasive with respect to the claims that are rejected above. First, as a result of further review of the claims with respect to 35 U.S.C. 101, a new grounds of rejection as shown in paragraph 5 above has been applied. With respect to the arguments concerning the

Roth reference and the amendment "wherein the first subset is a proper subset of the

plurality of data points" col. 8 lines 62-64 of Roth states:

"The final example shows the algorithm applied to situations where the outliers

are not noise, but instead, make up *another geometric primitive.*"

Then col. 8 lines 66, 67, col. 9 lines 1-3 of Roth further state:

"By simply applying the <u>extraction process on the **remaining outliers**</u>, the

second geometric primitive could be extracted. The extraction process can thus be used

to find a number of geometric primitives by such an iterative approach".

As shown above, as the extraction process is being applied on the remaining

outliers, it can be inferred that these outliers were not previously tested as they were

"remaining" outliers and therefore Roth does not necessarily test all the data points in

the plurality of data points at one time and thus the inliers referred to in col. 5 lines 45-

51 for example, can indeed be a proper subset of the total plurality of points (i.e. the set

which contains both inliers and outliers) against which the curve is being tested. With

respect to the arguments concerning the Silver et al. reference, the features being

argued here were rejected by the Roth reference and not the Silver et al. reference.

11.   No claims are allowed.

12.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Hal D Wachsman whose telephone number is 571-272-

2225. The examiner can normally be reached on Monday to Friday 7:00 A.M. to 4:30

P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Marc Hoff can be reached on 571-272-2216. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Hal D Wachsman
Primary Examiner
Art Unit 2857

HW
June 4, 2004